

ABSTRACT OF THE DISCLOSURE

A common narrow-band speech signal is expanded into a wide-band speech signal. The expanded signal gives the impression of a wide-band speech signal regardless of what type of vocoder is used in a receiver. The robust techniques 5 suggested herein are based on speech acoustics and fundamentals of human hearing. That is the techniques extend the harmonic structure of the speech signal during voiced speech segments and introduce a linearly estimated amount of speech energy in the wide frequency-band. During unvoiced speech segments, a fricated noise may be introduced in the upper frequency-band.

100 99 98 97 96 95 94 93 92 91 90 89 88 87 86 85 84 83 82 81 80 79 78 77 76 75 74 73 72 71 70 69 68 67 66 65 64 63 62 61 60 59 58 57 56 55 54 53 52 51 50 49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0